RCA
Solid State
Division

Power Transistors

2N3054 2N6260 2N6261
40372 40910 40911

JEDEC TO-66 H-1340

JEDEC TO-66
With Integral Heat Radiator H-1470A

Hometaxial II* Medium-Power Silicon N-P-N Transistors

Rugged Devices for Intermediate-Power Applications in Industrial and Commercial Equipment

Features:

- f_T = 800 kHz at 0.2 A (2N3054, 40372)
- Maximum safe-area-of-operation curves for dc and pulse operation
- $V_{CEV}(sus)$ = 90 V min (2N3054, 2N6261)
- Low saturation voltage: $V_{CE}(sat)$ = 1.0 V at I_C = 0.5 A (2N3054)

RCA 2N3054, 2N6260, and 2N6061 are hometaxial-base* silicon n-p-n transistors intended for a wide variety of medium- to high-power applications.

Types 40372, 40910, and 40911 are the 2N3054, 2N6260, and 2N6061 with factory-attached heat radiators intended for printed-circuit-board applications.

Applications:

- Power switching circuits
- Series- and shunt-regulator driver and output stages
- High-fidelity amplifiers
- Solenoid drivers

* "Hometaxial" was coined by RCA from "homogeneous" and "axial" to describe a single-diffused transistor with a base region of homogeneous-resistivity in the axial direction (emitter-to-collector).

"Hometaxial II" is a term used to describe RCA's expanded line of transistors produced by the hometaxial process.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

		2N6260 40910	2N3054 40372	2N6261 40911	
*COLLECTOR-TO-BASE VOLTAGE	V_{CBO}	50	90	90	V
COLLECTOR-TO-EMITTER VOLTAGE:					
* With base open	V_{CEO}	40	55	80	V
* With external base-to-emitter resistance (R_{BE}) = 100Ω	$V_{CER}(sus)$	45	60	85	V
With base reverse-biased (V_{BE} = 1.5 V)	$V_{CEV}(sus)$	50	90	90	V
*EMITTER-TO-BASE VOLTAGE	V_{EBO}	5	7	7	V
*CONTINUOUS COLLECTOR CURRENT	I_C	3	4	4	A
*CONTINUOUS BASE CURRENT	I_B	2	2	2	A
TRANSISTOR DISSIPATION:	P_T				
* At case temperature up to 25°C		29 (2N6260)	25 (2N3054)	50 (2N6261)	W
At ambient temperatures up to 25°C		5.8 (40910)	5.8 (40372)	5.8 (40911)	W
* At temperatures above 25°C		*See Figs. 4 & 11*	*See Figs. 4 & 9*	*See Figs. 1 & 7*	
*TEMPERATURE RANGE: Storage & Operating (Junction)		← -65 to 200 →			°C
*PIN TEMPERATURE (During Soldering): At distance ≥1/32 in. (0.8 mm) from seating plane for 10 s max.		← 235 →			°C

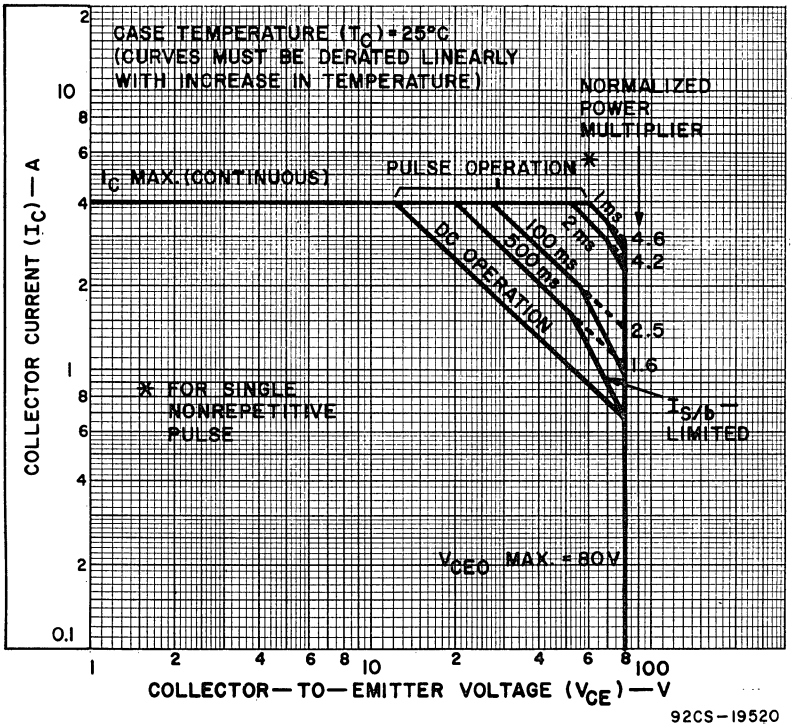
*In accordance with JEDEC registration data format JS-9 RDF-10 (2N3054), JS-6 RDF-2 (2N6260, 2N6261)

ELECTRICAL CHARACTERISTICS, *At Case Temperature (T_C) = 25°C unless otherwise specified*

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS						UNITS
		VOLTAGE V dc		CURRENT A dc		2N6260 40910		2N3054 40372		2N6261 40911		
		V_{CE}	V_{BE}	I_C	I_B	Min.	Max.	Min.	Max.	Min.	Max.	
*Collector-Cutoff Current: With base open	I_{CEO}	30			0	–	1	–	0.5	–	–	mA
		60			0	–	–	–	–	–	0.5	
With base-emitter junction reverse-biased	I_{CEX}	40	–1.5			–	5	–	–	–	–	mA
		80	–1.5			–	–	–	–	–	0.5	
		90	–1.5			–	–	–	1.0	–	–	
At T_C = 150°C	I_{CEX}	40	–1.5			–	25	–	–	–	–	mA
		80	–1.5			–	–	–	–	–	1.0	
		90	–1.5			–	–	–	6.0	–	–	
*Emitter-Cutoff Current	I_{EBO}		–5		0	–	5	–	–	–	–	mA
			–7		0	–	–	–	1.0	–	0.2	
Collector-to-Emitter Sustaining Voltage: * With base open	$V_{CEO(sus)}$			0.1[a]	0	40	–	55	–	80	–	V
With external base-to-emitter resistance (R_{BE}) = 100Ω	$V_{CER(sus)}$			0.1[a]		45	–	60	–	85	–	V
*DC Forward-Current Transfer Ratio	h_{FE}	2		4[a]		3	–	–	–	5	–	
		2		1.5[a]		–	–	–	–	25	100	
		4		3[a]		–	–	5	–	–	–	
		4		0.5[a]		–	–	25	150	–	–	
		4		1.5[a]		20	100	–	–	–	–	
*Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$			0.5[a]	0.05[a]	–	–	–	1.0	–	–	V
				1.5[a]	0.15[a]	–	1.5	–	–	–	0.5	
				3[a]	1[a]	–	–	–	6.0	–	–	
*Base-to-Emitter Voltage	V_{BE}	2		1.5		–	–	–	–	–	1.5	V
		4		1.5		–	2.2	–	–	–	–	
		4		0.5		–	–	–	1.7	–	–	
*Common-Emitter, Small-Signal, Short-Circuit, Forward Current Transfer Ratio Cutoff Frequency	f_{hfe}	4		0.1		0.03	–	0.03	–	0.03	–	MHz
*Magnitude of Common-Emitter, Small-Signal, Short-Circuit Forward Current Transfer Ratio (f = 0.4 MHz)	$\|h_{fe}\|$	4		0.1		2	–	–	–	2	–	
*Common-Emitter, Small-Signal, Short-Circuit Forward Current Transfer Ratio (f = 1 kHz)	h_{fe}	4		0.1		25	–	25	–	25	–	
Forward-Bias Second Breakdown Collector Current (t = 1 s)	$I_{S/b}$	40				0.725	–	–	–	–	–	A
		80				–	–	–	–	0.625	–	
		55				–	–	0.455	–	–	–	
Thermal Resistance: Junction-to-Case	$R_{\theta JC}$					6 (max.) 2N6260		7 (max.) 2N3054		3.5 (max.) 2N6261		°C/W
Junction-to-Ambient	$R_{\theta JA}$					30 (max.) 40910		30 (max.) 40372		30 (max.) 40911		

[a]Pulsed: Pulse duration = 300 μs, duty factor = 1.8%.

*In accordance with JEDEC registration data format JS- 9 RDF-10 (2N3054) JS-6 RDF-2 (2N6260-61)



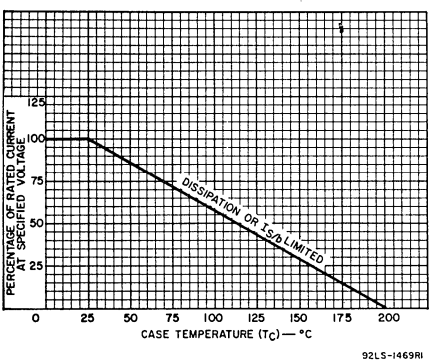


Fig.2—Current derating curve for all types.

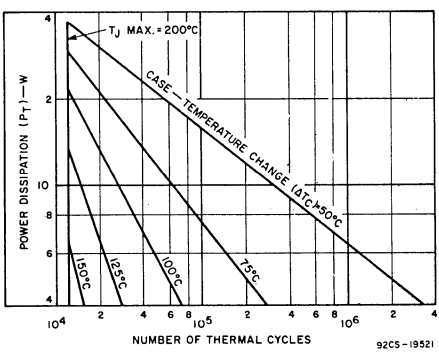


Fig.3—Thermal-cycle rating chart for type 2N6261.

TERMINAL CONNECTIONS
FOR 2N3054, 2N6260, & 2N6261

Pin 1 - Base
Pin 2 - Emitter
Case, Mounting Flange - Collector

TERMINAL CONNECTIONS
FOR 40372, 40910 & 40911

Pin 1 - Base
Pin 2 - Emitter
Heat Radiator-Collector

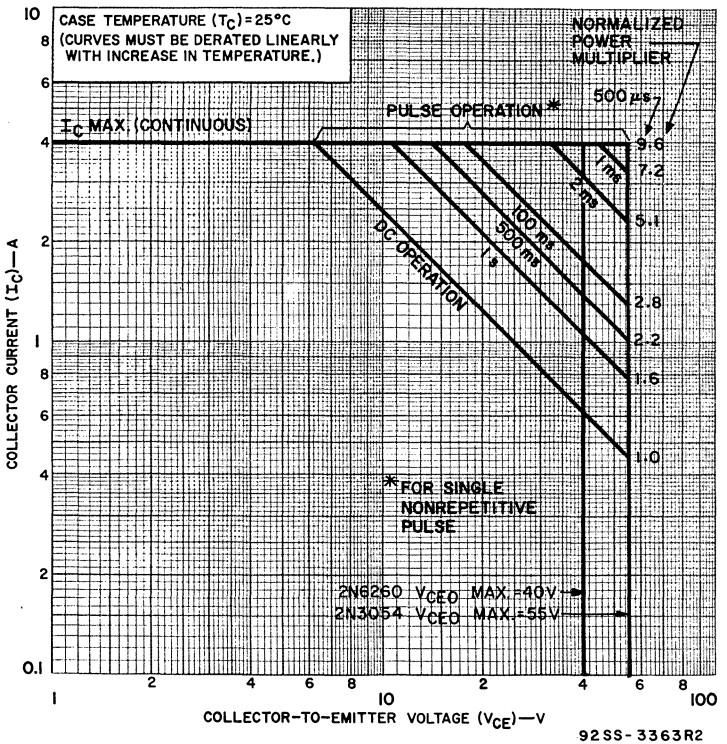


Fig.4—Maximum operating areas for types 2N3054 and 2N6260.

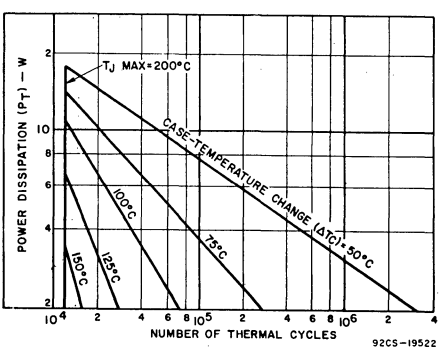


Fig.5— Thermal-cycle rating chart for type 2N3054.

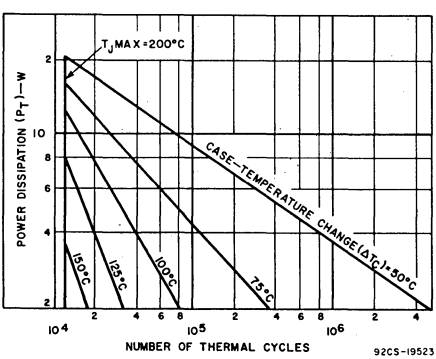


Fig.6— Thermal-cycle rating chart for type 2N6260.

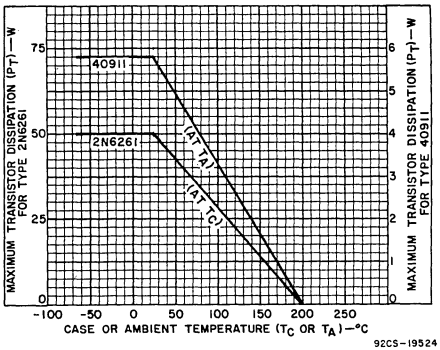


Fig.7—Dissipation derating curve for types 2N6261 and 40911.

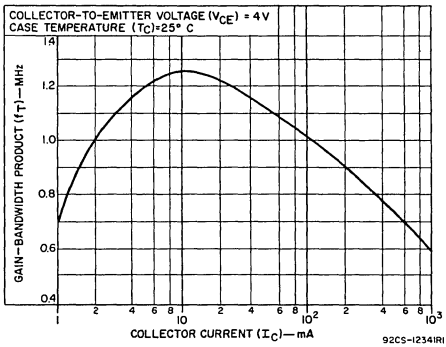


Fig.8—Typical gain-bandwidth product for all types.

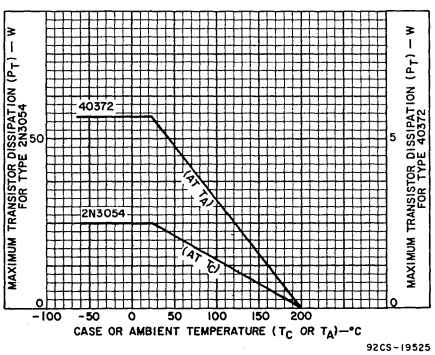


Fig.9—Dissipation derating curve for types 2N3054 and 40372

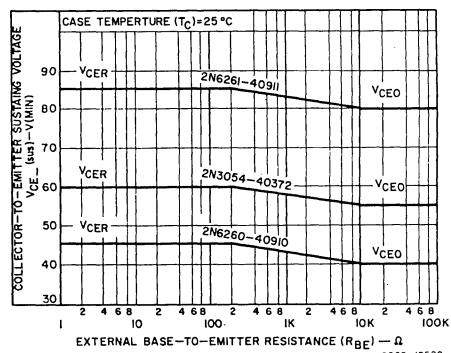


Fig.10—Sustaining voltage vs. base-to-emitter resistance for all types.

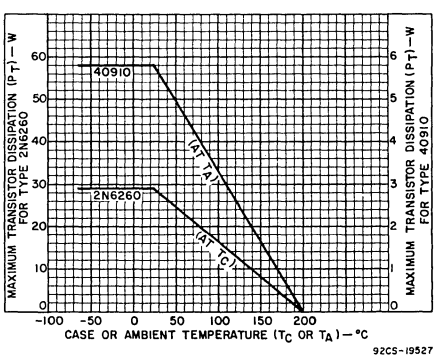


Fig.11—Dissipation derating curve for types 2N6260 and 40910.

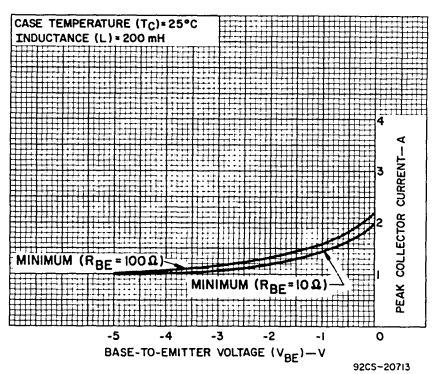


Fig.12—Reverse-bias second-breakdown characteristics for all types.

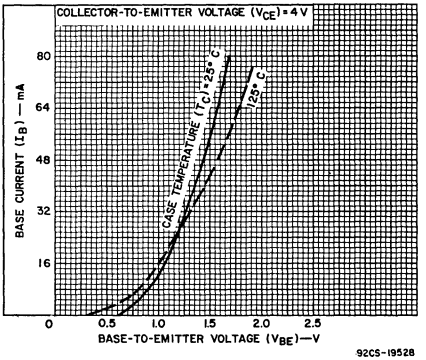


Fig.13—Typical input characteristics for types 2N6261 and 40911.

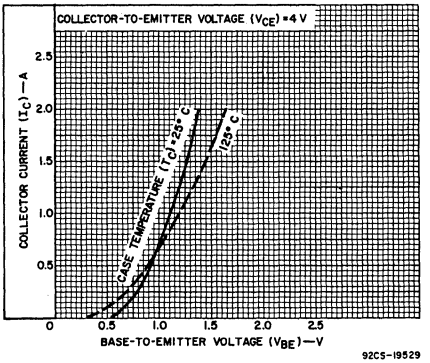


Fig.14—Typical transfer characteristics for types 2N6261 and 40911.

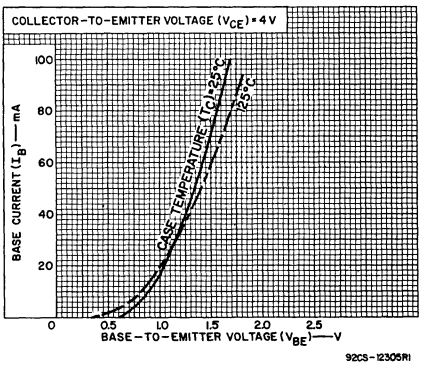


Fig.15—Typical input characteristics for types 2N3054 and 40372.

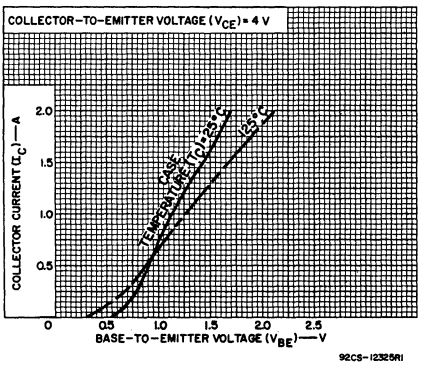


Fig.16—Typical transfer characteristics for types 2N3054 and 40372.

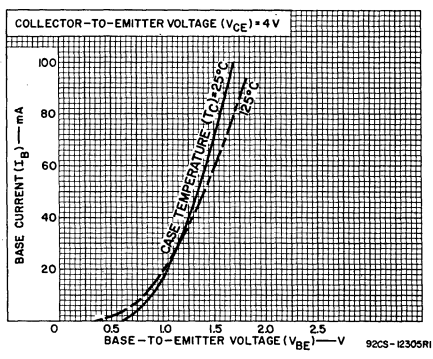


Fig.17—Typical input characteristics for types 2N6260 and 40910.

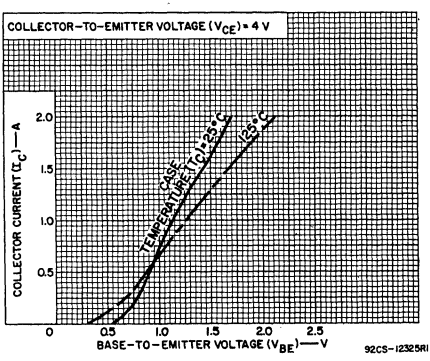


Fig.18—Typical transfer characteristics for types 2N6260 and 40910.

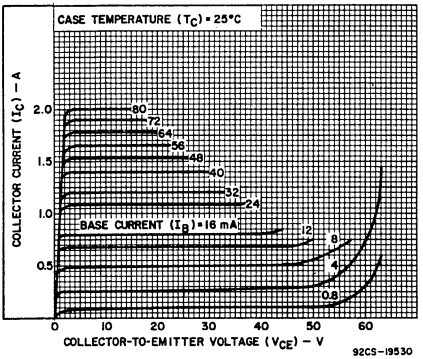


Fig.19—Typical output characteristics for types 2N6261 and 40911.

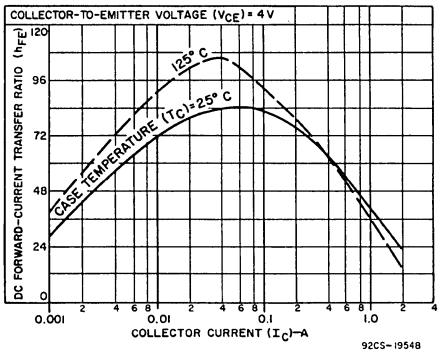


Fig.20—Typical dc beta characteristics for types 2N6261 and 40911.

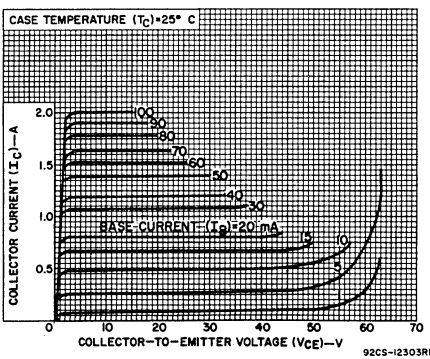


Fig.21—Typical output characteristics for types 2N3054 and 40372.

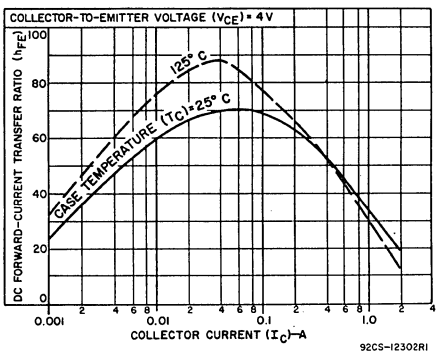


Fig.22—Typical dc beta characteristics for types 2N3054 and 40372.

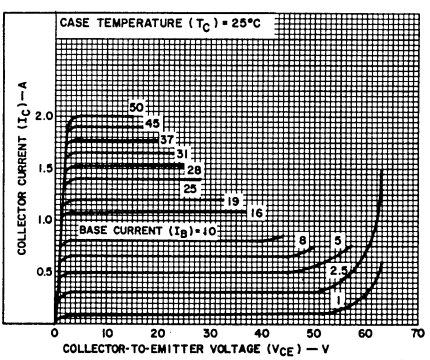


Fig.23—Typical output characteristics for types 2N6260 and 40910.

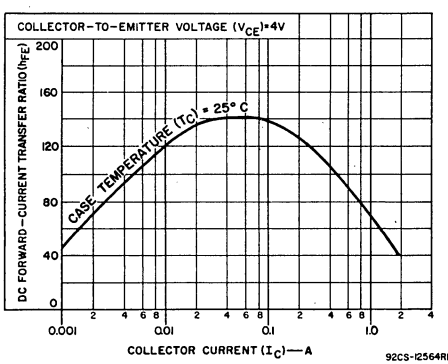


Fig.24—Typical dc beta characteristics for types 2N6260 and 40910.